

Patent Claims:

1 1. An electrical device for generating a multi-rate pseudo
2 random noise (PN) sequence comprising:

3 · sequence generator adapted to output a plurality of
4 sequence values based on a step control signal (S_t),

5 · selection system adapted to select one of said
6 plurality of sequence values based on a select value (M_t),
7 and

8 · step control adapted to provide said step control
9 signal (S_t).

1 2. An electrical device according to claim 1, wherein said
2 select value (M_t) is provided based on a clock control
3 value/signal (C_t) and a previously generated select value (M_{t-1}).
4

1 3. An electrical device according to claim 1 wherein, said
2 step control signal (S_t) is provided based on a clock control
3 value/signal (C_t) and a previously generated select value (M_{t-1}).
4

1 4. An electrical device according to claim 1, wherein:
2 · said plurality of sequence values is two,

3 · said select value (M_t) is calculated as $M_t = (C_t +$
4 $M_{t-1}) \text{ MOD } 2$, and

5 · said step control signal (S_t) is calculated as S_t
6 $= (C_t + M_{t-1}) \text{ DIV } 2$.

1 5. An electrical device according to claim 1, wherein:

2 · said plurality of sequence values is N , where N is
3 at least 3,

4 · said select value (M_t) is calculated as $M_t = (C_t + M_{t-1}) \text{ MOD } N$, and

5 · said step control signal (S_t) is calculated as S_t
6 $= (C_t + S_t) \text{ DIV } N$.
7

1 6. An electrical device according to claim 1, wherein said
2 sequence generator comprises a windmill polynomial sequence
3 generator.

1 7. An electrical device according to claim 6, wherein said
2 sequence generation means comprises:

3 · a plurality of delay elements,

4 · step control unit receiving a next block control
5 signal as input, and

6 · sum elements,

7 where each said delay element is connected to another and two
8 of them are additionally connected to themselves via said sum
9 element.

1 8. An electrical device according to claim 1, wherein said
2 electrical device is used in a portable device.

1 9. A device according to claim 8, wherein said portable
2 device comprises a mobile telephone.

1 10. A device according to claim 1, wherein said electrical
2 device is used in a stationary communication device.

1 11. A method of generating a multi-rate PN sequence
2 comprising the steps of:

3 · generating a plurality of sequence values based on
4 a step control signal (S_t), the method further comprising the
5 steps of:

6 · providing a select value (M_t),
7 · providing the step control signal (S_t), and
8 · selecting one of said plurality of sequence values
9 on the basis of the select value (M_t).

1 12. A method according to claim 11, wherein said select
2 value (M_t) is provided on the basis of a clock control
3 value/signal (C_t) and a previously generated select value (M_{t-1}).
4

1 13. A method according to claim 11 wherein, said step
2 control signal (S_t) is provided on the basis of a clock
3 control value/signal (C_t) and a previously generated select
4 value (M_{t-1}).

1 14. A method according to claim 11, wherein
2 · said plurality of sequence values is two,
3 · said select value (M_t) is calculated as $M_t = (C_t +$
4 $M_{t-1}) \text{ MOD } 2$, and
5 · said step control signal (S_t) is calculated as S_t
6 $= (C_t + M_{t-1}) \text{ div } 2$.

1 15. An method according to claim 11, wherein
2 · said plurality of sequence values is N, where N is
3 at least 3,
4 · said select value (M_t) is calculated as $M_t = (C_t +$
5 $M_{t-1}) \text{ MOD } N$, and
6 · said step control signal (S_t) is calculated as S_t
7 $= (C_t + S_t) \text{ DIV } N$.

8 16. A method according to claim 11, wherein said plurality
9 of sequence values is generated by a windmill polynomial
10 sequence generator.

1 17. A method according to claim 11, wherein said method is
2 used in a portable device.

1 18. A method according to claim 17, wherein said method is
2 used in a mobile telephone.

1 19. A method according to claim 11, wherein said method is
2 used in a stationary communication device.